IN THE SPECIFICATION

On page 1, please amend the paragraph beginning at line 10 as follows:

--The present invention relates to a method for sharpening ~~images as presented in the preamble of the appended claim 1~~ colours in an image comprising at least a first and a second colour component, the pixels comprising information of the first colour component being located at least partly in locations different from the pixels comprising information of the second colour component. The present invention also relates to a method for processing digital signals in an image ~~as presented in the preamble of the appended claim 20~~ comprising at least one colour component. The present invention also relates to a digital filter for processing digital signals in an image ~~as presented in the preamble of the appended claim 32~~ comprising at least one colour component. The present invention also relates to a system ~~as presented in the preamble of the appended claim 33~~ for sharpening colours in an image with at least a first and a second component and the pixels comprising information about the first colour component are placed at least partly in different locations than the pixels comprising information of the second colour component. Furthermore, the present invention relates to a device ~~as presented in the preamble of the appended claim 38~~ for forming an image, which comprises means for sharpening colours in an image with at least a first and a second colour component, and the pixels comprising information about the first colour component being placed at least partly in different locations than the pixels comprising information of the second colour component, a storage means ~~as presented in the preamble of the appended claim 44~~ for storing a computer software product, which comprises computer commands for sharpening colours in an image with at least a first and a second colour component, and the pixels comprising information about the first colour component being placed at least partly in different locations than the pixels comprising information of the second colour component.~~, and~~ The present invention further relates to a computer software product ~~as presented in the preamble of the appended claim 46~~ comprising computer commands for sharpening colours in an image with at least a first and a second colour component, and the pixels comprising information about the first colour component being placed at least partly in different locations than the pixels comprising information of the second colour component.--

On page 5, please amend the paragraph beginning at line 6 as follows:

--It is an aim of the present invention to facilitate the problems occurring in image processing by ~~combing~~ combining the interpolation and the sharpening in such a way that the effect of the sharpening filtering of the first colour component is utilized to control the sharpening of the next colour components. In the method for sharpening an image according to the invention, one colour component is first interpolated and this interpolated colour component is sharpened. After this, the effect of the sharpening on the interpolated image is examined by deducing from each pixel of the sharpened image the corresponding pixel of the unsharpened image. If the effect of the sharpening on the first component was significantly high in a given pixel, the sharpening is performed for the second or third colour component, if there is one at the point in question. If the effect was lower, the possible pixel of the second or third colour component is kept unchanged. In this way, the original pixels of the second and third colour components are, for the necessary parts, already sharpened before the interpolation of these colour components. In the filtering, it is possible to use any filtering mask of the prior art. However, the most advantageous final result is obtained by using such an adaptive sharpening filter which only processes those pixels which are true edge pixels, wherein the edge strength can be used in the control of the sharpening.--

On page 5, please amend the paragraph beginning at line 26 as follows:

--To put it more precisely, the method for sharpening images according to the present invention is primarily characterized ~~in what will be presented in the characterizing part of claim 1~~ by sharpening the second colour component on the basis of the sharpening of the first colour component. The method for processing digital signals in an image is primarily characterized ~~in what will be presented in characterizing part of claim 20~~ by the change of the colour component computed in at least two different directions to obtain at least two original change values, from the computed original change values, a maximum value and a minimum are selected to obtain at least two change values, and a ratio is determined based on said change values. The digital filter for processing digital signals in an image is primarily characterized ~~in what will be presented in characterizing part of claim 32~~ by performing the above method for processing digital signals in an image. The system according to the invention is primarily characterized ~~in what will be presented in the characterizing part of the independent claim 33~~ by means for sharpening the second colour component on the basis of the sharpening of the first colour component. The device according to the invention is primarily characterized ~~in what will be presented in the characterizing part of the independent claim 38~~ by means for sharpening the second colour component on the basis of the sharpening of the first colour component. The storage means according to the invention is primarily characterized ~~in what will be presented in the characterizing part of the independent claim 44~~ by a computer software product that comprises computer commands for controlling the sharpening of said second colour component on the basis of the sharpening of said first colour component. The computer software product according to the invention is primarily characterized ~~in what will be presented in the characterizing part of the independent claim 46~~ by computer commands for sharpening colours in an image with at least a first and a second colour component, and the pixels comprising information about the first colour component being placed at least partly in different locations than the pixels comprising information of the second colour component.--

On page 9, please amend the paragraph beginning at line 14 as follows:

--For a human observer, the changes are normally more significant in the horizontal and vertical directions; therefore, the diagonal gradients are attenuated by multiplying them with a constant smaller than ~~the figure~~ one. Furthermore, it should be taken into account that in the diagonal directions, the distance between the adjacent pixels is greater than in the horizontal and vertical directions. The ratio between the distances is exactly $1/\sqrt{2} \approx 0.71$.

On page 18, please amend the paragraph beginning at line 9 as follows:

--The above-described image sharpening method can also be carried out by using another change value T3 instead of the change value T2. The change value T3 is the absolute value of that original gradient value that is, in order of the original change values, closer to the value having a larger absolute value of the selected minimum and maximum values ~~that~~ than to the one having a smaller absolute value. In other words T3 is the absolute value of that original gradient value which follows the gradient value indicated by T2 when proceeding towards to the gradient value indicated by T1 in order of the original change values. For example, there are gradient values, i.e. the original change values in order, -8, -1, 2 and 5. From said original change values the minimum (-8) and maximum (5) values are selected. The larger absolute value of those is marked as T2 and smaller one is marked as T1, wherein T2 = 8 and T1 = 5. As said, the value T3 is the absolute value of the gradient value closer to the gradient value behind T2, wherein the wanted gradient is -1 and the absolute value of T3 is 1. It should be noticed that the T3 is not necessarily the value with the second largest absolute value, because (like in the presented example) the second largest absolute value is T1, which is already used for indicating the smallest change. Also the gradient 2 has a larger absolute value than the gradient -1, but the gradient 2 is in order closer to the T1, wherein it cannot be chosen for T3.--

On page 19, please amend the paragraph beginning at line 27 as follows:

--One example of the appearance of the noise is shown in figure 7. ~~The figure~~ Figure 7 shows a flat area containing one noisy pixel N. When the noisy pixel is a centre pixel of the sharpening window (figure 7a), it is not sharpened according to the invention. But when it is not in the middle (figure 7b), it affects to the sharpening. The noisy pixel N is selected for T2, which causes the original single noisy pixel to be surrounded by changed pixel values in the filtered image, and this emphasizes the visibility of the noisy pixel. This situation is simplified to figure 8, where figure 8a shows the original pixel, which is filtered by T2 (figure 8b) and which is filtered by T3 (figure 8c). As it can be noticed, the use of the value T2 accentuates the noise in the filtered area.

On page 20, please amend the paragraph beginning at line 4 as follows:

--The above-described image sharpening method is carried out with the high-pass mask. This is not mandatory for also the band-pass mask can be used either alone or combined with the high-pass filtering. The band-pass mask takes samples from larger area and thus it is capable to enhance low-gradient edges, which are not seen by the high-pass mask. Figure 9 ~~show~~ shows some examples of how high-pass (9a), corresponding band-pass (9b) and combined high-pass/band-pass (9c) masks can be made. The combined high-pass/band-pass mask (HP+BP) behaves like the high-pass filter (HP), but it operates on lower frequencies also, as can be seen from figure 10; the –6 dB point (gain=2) of the high-pass filter (HP) is at frequency of 0.5 and with the combined filter (HP+BP) it is on much lower frequency, at 0.25. The figure 10a shows linear gain, wherein the figure 10b shows logarithmic scale for gain.--

On page 20, please amend the paragraph beginning at line 32 as follows:

--The above-described image sharpening method according to the invention can be implemented with an image processing system which is shown in Fig. 5. An imaging device C (a camera or the like) produces a Bayer matrix image I for the image processing system. The matrix image I is divided in a colour separation unit S into three colour components which are represented by signals R, G, B. For example, the signal G represents the green colour component which is led for processing in an interpolation unit 1 to generate a signal G1. The interpolated signal G1 is sharpened in a sharpening unit 2, the resulting signal G2 being compared with the interpolated signal G1. The deviation G3 from the signals G2-G1 given by a differential unit D is led together with the colour signals R, B to another sharpening unit 3. The colour signals R, B are preferably the red and blue colour components. If necessary, said signals R, B ~~and~~ are sharpened in the second sharpening unit by the effect of the deviation G3. Next, the formed sharpened signals R1, B1 are led to a second interpolation unit 4, in which the signals R1, B1 are processed, producing interpolated signals R2, B2. In said interpolation unit 4, the colour pixels to be interpolated (from which the green colour component G was missing) are automatically sharpened. As the output from the image processing system, a three-colour image is obtained, in which each colour component has been sharpened.--